PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

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Fish Habitat Enhancement Potential And Stocking Assessment Of Gantahaz Lake

A. R. McLean
1991

PWFWCP Report No. 119

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The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

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Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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GANTAHAZ LAKE

WATERSHED: Parsnip River

DATE OF SURVEY: June 21. 22. 1991

FIELD CREW LEADER: A.R. McLean

FIELD ASSISTANT: A.R. Langston

PEACE FISHERIES COMPENSATION PROGRAM

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ENVIRONMENTAL RESOURCES

and

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FISH AND WILDLIFE BRANCH

REPORT PREPARED BY: A.R. McLean

Lake: **GANTAHAZ**

INTRODUCTION

A standard fisheries baseline reconnaissance of Gantahaz Lake was carried out by the Fish and Wildlife Branch (Prince George) in August of 1970. The report (data sheets) is on file at the Ministry of Environment, Fish and Wildlife Branch in Prince George.

Gantahaz Lake has been stocked with brook trout since 1976 (table 1).

Gantahaz Lake (Plate #1) was investigated in June of 1991 by the Peace Fisheries Compensation Program to identify potential fisheries enhancement projects and to determine if changes to the current stocking program are recommended.

STOCKING HISTORY

TABLE 1
GANTAHAZ LAKE STOCKING HISTORY

Year	Species	Number	Size (grams)	Stage	Stock
1991	brook trout	15,000	1.6	UN	KTH
1990	brook trout	20,000	3.0	UM	Aylmer
1989	brook trout	20,000	3.2	UN	Aylmer
1988	brook trout	20,000	3.4	UN	Aylmer
1987	brook trout	15,000	2.6	UN	Aylmer
1986	brook trout	10,000	3.5	UN	Aylmer
1985	brook trout	15,000	2.4	UN	Aylmer
1984	brook trout	16,000	3.9	UN	Aylmer
1983	brook trout	15,000	2.4	UN	Aylmer
1982	brook trout	16,000	1.4	UN	Aylmer
1981	brook trout	15,000	1.9	UN	Aylmer
1980	brook trout	16,000	2.7	UN	Aylmer
1979	brook trout	16,000	2.5	FR	Aylmer
1978	brook trout	16,000	4.2	FR	Aylmer
1976	brook trout	16,000	3.1	FR	Aylmer

LOCATION

Location: within the District of Mackenzie
Elevation: 716 m +/-
Latitude/Longitude: 55°22'50":123°08'40" U.T.M.: 10.4909.61368
Management Unit: 7-30 N.T.S. Map No.: 93-06 (edition 2)
Drainage: Internal

Plate 1: Panoramic view of Gantahaz Lake, looking northeast, taken from centre of lake. Arrow indicates boat launch location.

Lake: **GANTAHAZ**

METHODS

One sinking monofilament gill net (4 hour set) and two minnow traps (8 and 7 hour sets) were set to determine relative abundance and identification of fish species in Gantahaz Lake (See Appendix 1 for net set details) (See figure 1 for net set locations).

Brook trout and lake whitefish were sampled for length, weight, sex, maturity, stomach contents and parasite/disease presence (Appendix 2). Scale samples were collected for age determination. General appearance of the brook trout was recorded through visual analysis. The total catch and size range of lake chub captured during the investigation was also recorded.

The fisheries enhancement potential of the lake was determined through visual observation and recording of physical data, using standard methodologies outlined in the Fish/Habitat Inventory and Information Program (1987 Stream Survey Field Guide).

On site anglers were interviewed opportunistically. Salmonid catch per unit effort information was recorded from these anglers and angling undertaken by program staff.

An attempt was made to locate the benchmark set during the initial study (1970). Any change in water level was measured using an elson tape, in combination with an abney level.

Photo documentation of the investigation was also completed (see figure 1 for photo locations).

Figure 1

Lake: **GANTAHAZ**

RESULTS & DISCUSSIONS

One 4 hour net set produced 30 brook trout and 19 lake whitefish (table 2). Two minnow traps yielded 316 lake chub (table 3). Average fork length, weight and condition factor was calculated for the captured brook trout and lake whitefish, (table 4).

TABLE 2
LAKE CATCH SUMMARY

Species	Net Site Number				Angled	Other	Total	Number Sampled	Number Preserved	Size Range (cm)
	1	2	3	4						
brook trout	30	-	-	-	-	-	30	30	-	21.7 - 45.2
lake whitefish	19	-	-	-	-	-	19	19	-	29.1 - 40

TABLE 3
MINNOW TRAP CATCH

#	Hours	Depth (m)	Substrate	Species	Size Range (cm)
1	8.25	0.4	gravel/fines	144 lake chub	5.4 - 9.3
2	7.25	0.8	organics	172 lake chub	5.1 - 8.9

Bait: Sardines

TABLE 4
AVERAGE LENGTH, WEIGHT AND CONDITION FACTOR

Brook Trout	Fork Length (cm)	Weight (grams)	Condition Factor
Number	30	30	30
Mean	32	633.7	1.63
STD	7.3	423.1	0.24
MIN	21.7	110	0.76
MAX	45.2	1440	2.20
Lake Whitefish	**Fork Length (cm)**	**Weight (grams)**	**Condition Factor**
Number	18	18	18
Mean	35	736.1	1.68
STD	3.5	213.8	0.10
MIN	29.1	425	1.53
MAX	40	1075	1.86
		Condition Factor Formula: k=(W(grms)x100)/L(cms)3	

Lake: **GANTAHAZ**

Length vs Age

An indication of growth rate is provided through the length/age relationship of the brook trout (table 5, figure 2).

TABLE 5
LENGTH/AGE RELATIONSHIP

Species	Age	Sample Size	Mean (cm)	Std Dev.	Min(cm)	Max(cm)
brook trout	2	10	26.3	2.2	22.1	30.5
brook trout	3	11	31.2	2.4	26.3	35.7
brook trout	4	4	40.7	2.4	37.9	44.1
brook trout	5	8	42.4	1.8	39.6	45.2

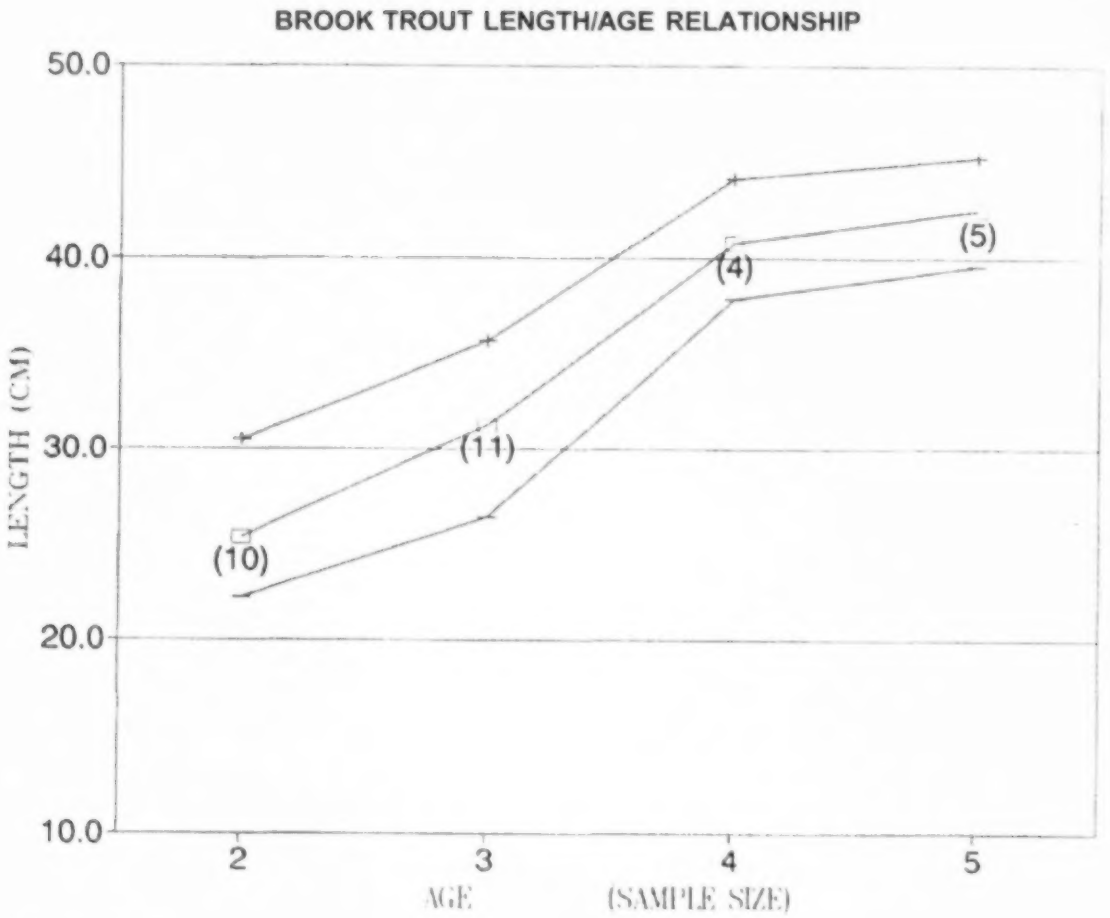

figure 2

Lake: **GANTAHAZ**

Length vs Weight

The proportionate upward trend in the length/weight relationship of the brook trout in Gantahaz Lake is shown in figure 3.

BROOK TROUT LENGTH/WEIGHT RELATIONSHIP

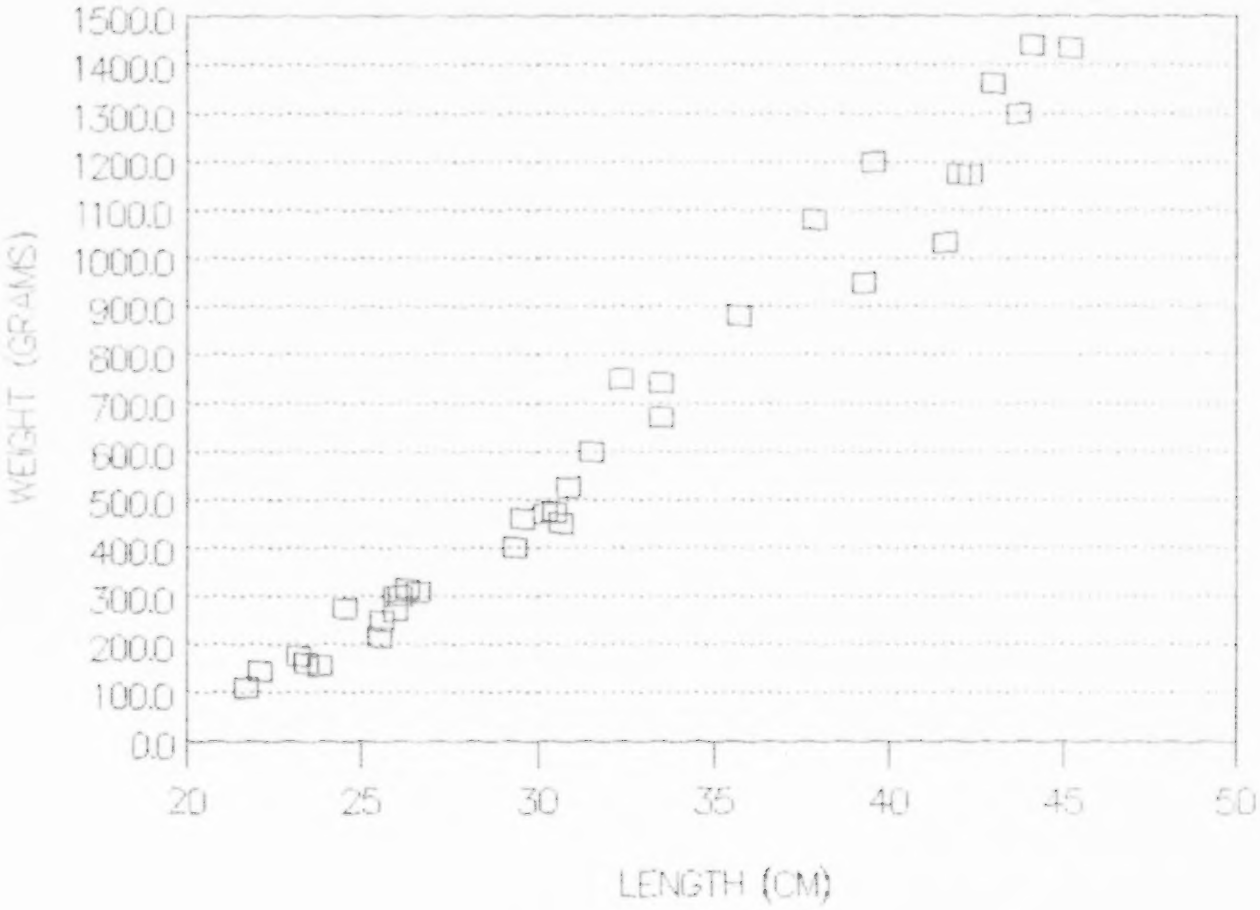

figure 3

Lake: **GANTAHAZ**

BIOLOGICAL ANALYSIS OF BROOK TROUT

The brook trout captured during the investigation consisted of 12 males and 18 females. Reproduction organ analysis indicated 9 of the female brook trout were spawnbound, with 2 spawning cycles of eggs noted in the examined specimens. One brook trout was mature, 2 were maturing and 18 were sexually immature. Stomach content examination revealed a diet of Gammarus and insects. Tapeworms were noted in 3 of the examined stomachs. The brook trout captured appeared healthy.

DRAINAGE

Internal.

ANGLER USE AND CATCH PER UNIT EFFORT

Creel information was gathered from 3 individuals and our own angling efforts (2 people). Five people fishing for 2 hours yielded no fish. The 3 anglers interviewed indicated the catch rate at Gantahaz Lake has slowed down over the past few years.

BENCHMARK

The original benchmark set in 1970 was not located. It is suspected that the tree which it was set has been removed. The benchmark was not re-set.

MISCELLANEOUS COMMENTS

Local anglers indicated that large numbers of brook trout spawners were observed around the boat launch area in the fall.
Local anglers interviewed were not aware of lake whitefish presence in the lake.

RESORTS AND CAMPSITES

A day use site and boat launch are present at the east side of the lake.
A groomed trail is believed to exist around the lake.

Lake: **GANTAHAZ**

FISHERIES MANAGEMENT COMMENTS

Gantahaz Lake supports a population of brook trout (stocked), lake whitefish and lake chub. The brook trout captured during the investigation have a healthy appearance, and appear to be in good condition (C.F. 1.6 (1.1-2.2))(Plate #2). The lake whitefish captured appear to be doing very well in Gantahaz Lake (Plate #3). The lake whitefish and brook trout are targeting the same food source. Approximately 30% of the netted brook trout were spawn bound, with 2 spawning cycles of eggs noted in the examined specimens. Brook trout have been observed attempting to shore spawn at gravel shoal locations in the lake, including the boat launch area. Five people angling for 2 hours produced no fish. The anglers interviewed were not aware of the lake whitefish presence in the lake. A total of 15,000 brook trout were stocked into Gantahaz Lake in 1991.

Stocking Program

The stocking program appears to be successful, however thorough recommendations with regard to this cannot be made until total angler use and C.P.U.E. is assessed. Stocking Gantahaz Lake with the same density, frequency, and strain of fish per year is recommended until 1995. This will significantly improve future stocking program evaluation recommendations. A stocking program evaluation is recommended in 1995.

Enhancement Potential

Gravel placement at the boat launch area is recommended. This should aide the brook trout in egg/milt deposition.

Post Survey Note

On October 10, 1992, approximately 60 cubic yards of 3/4 inch, wash, no fracture gravel was placed in and around the boat launch area by the Peace Fisheries Compensation Program.

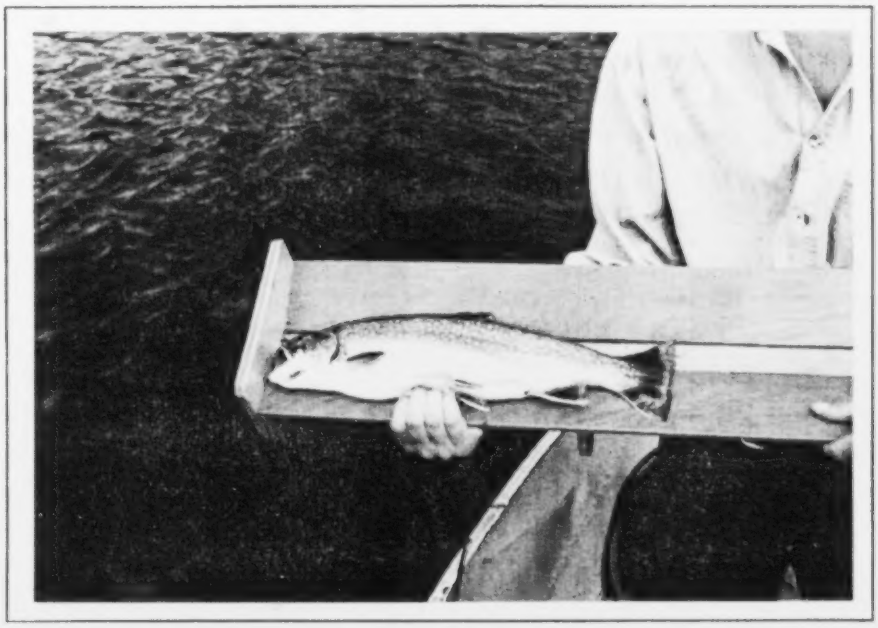

Plate 2: Brook trout (43.7 cm, 1300 grams) captured in net set.

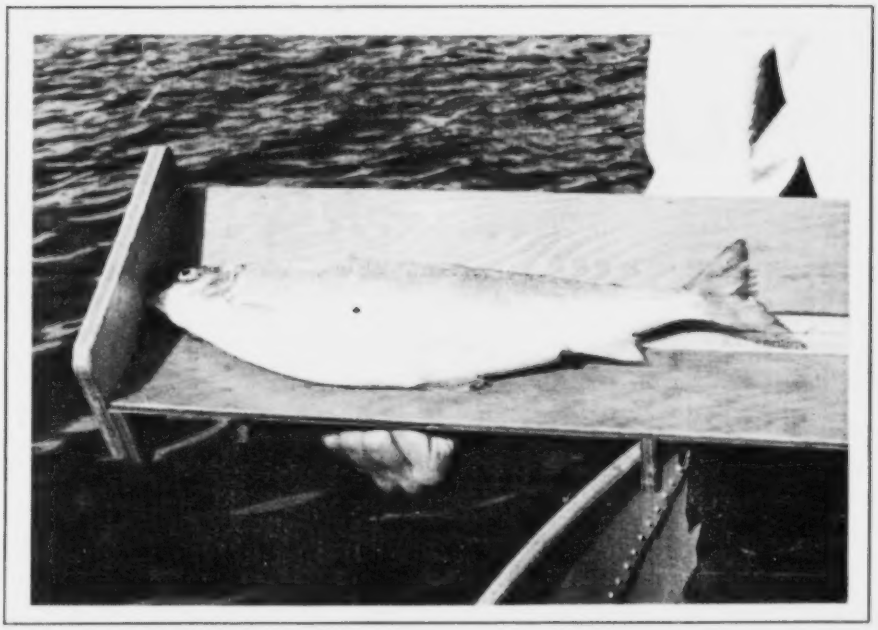

Plate 3: Lake whitefish (41 cm, 1050 grams) captured in net set.

Lake: **GANTAHAZ**

APPENDIX 1

Lake: **GANTAHAZ**

NETTING RECORD

Number of panels: 6
Individual panel length: 15.2 m
Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	June 22, 1991	Time:	0945 hrs
Date Lifted:	June 22, 1991	Time:	1345 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	1.0 m
		Substrate:	fines/organics/cobble
Deep End Mesh Size:	64 mm	Depth:	11.0 m
		Substrate:	organics

Comments:

Brook trout captured in panels 1-5 (from shore).
Lake whitefish caught primarily in panel 6 (deep end).

Lake: **GANTAHAZ**

APPENDIX 2

Lake: **GANTAHAZ**

INDIVIDUAL FISH DATA

Date Captured: June 22, 1991

M - Male, F - Female, ? - Not Obvious
IMM - Immature, MG - Maturing, MT - Mature, GV - Gravid, SP - Spent, ? - Not Obvious
EG - Egg, FR - Fin Ray, HD - Head, ML - Milt, OT - Otolith
SC - Scale, ST - Stomach, TG - Fish Tag, WF - Whole Fish

Method of Capture: sinking monofilament gillnet

SPECIES	Fork Length (cm)	Weight (grains)	Sex	Gonadal Maturity	Sample Type	Age (yr)	Stomach Contents				COMMENTS
							Plankton	Insects	Fish	Other	
brook trout	22.1	145	M	IMM	SC	2+		mosquito larvae		Gammarus	
brook trout	23.3	175	F	IMM	SC	2+					
brook trout	23.4	160	M	IMM	SC	2+		mosquito larvae		Gammarus	
brook trout	24.5	275	M	IMM	SC	2+		unidentified larvae		Gammarus	
brook trout	25.5	215	F	IMM	SC	2+				Gammarus tapeworm	
brook trout	25.6	250	F	IMM	SC	2+		unidentified larvae			
brook trout	26.0	300	M	IMM	SC	2+		mosquito larvae			
brook trout	26.0	270	F	IMM	SC	2+		mosquito larvae		Gammarus	
brook trout	26.1	300	F	IMM	SC	2+					
brook trout	26.3	315	F	IMM	SC	3+					
brook trout	29.4	400	F	IMM	SC	3+		mosquito larvae			
brook trout	29.6	460	F	IMM	SC	3+		mosquito larvae			
brook trout	30.2	470	M	IMM	SC	3+		mosquito larvae		Gammarus tapeworm	
brook trout	30.5	475	M	IMM	SC	2+		mosquito larvae		tapeworm	
brook trout	30.7	450	M	IMM	SC	3+		mosquito larvae			
brook trout	30.9	525	M	IMM	SC	3+		mosquito larvae		Gammarus	
brook trout	31.5	600	M	MT	SC	3+				Gammarus	
brook trout	32.4	750	F		SC	3+		mosquito larvae		Gammarus	* 100 eggs retained from 1990
brook trout	33.5	670	F	MG	SC	3+				Gammarus	
brook trout	33.5	740	M	IMM	SC	3+		unidentified insects			
brook trout	35.7	880	F		SC	3+		mosquito larvae			* 30 eggs retained from 1990
brook trout	37.9	1,080	F		SC	4+		aquatic insects		Gammarus	* 16 eggs retained from 1990
brook trout	39.3	950	M	IMM	SC	4+		mosquito larvae			
brook trout	39.6	1,200	F		SC	5+				Gammarus	* 100 eggs retained from 1990
brook trout	41.6	1,030	F		SC	4+		unidentified insects			* 6 eggs retained from 1990
brook trout	42.0	1,175	F		SC	5+		aquatic insects		Gammarus	* 4 eggs retained from 1990
brook trout	42.3	1,175	M	MG	SC	5+		unidentified larvae		Gammarus	
brook trout	43.0	1,360	F		SC	5+				Gammarus	* 150 eggs retained from 1990
brook trout	44.1	1,440	F		SC	4+		mosquito larvae		Gammarus	* 100 eggs retained from 1990
brook trout	45.2	1,435	F		SC	5+					* 150 eggs retained from 1990

* still retaining eggs (small, yellowish) from 1989.

Lake: **GANTAHAZ**

INDIVIDUAL FISH DATA

Date Captured: June 22, 1991

Method of Capture: sinking monofilament gillnet

M - Male, F - Female, ? - Not Obvious

IMM - Immature, MG - Maturing, MT - Mature, GV - Gravid, SP - Spent, ? - Not Obvious

EG - Egg, FR - Fin Ray, HD - Head, ML - Milt, OT - Otolith

SC - Scale, ST - Stomach, TG - Fish Tag, WF - Whole Fish

SPECIES	Fork Length (cm)	Weight (grams)	Sex	Gonadal Maturity	Sample Type	Age (yr)	Stomach Contents				Comments
							Plankton	Insects	Fish	Other	
lake whitefish	29.1	430	M	MG	SC	3+		unidentified larvae		shrimp	
lake whitefish	29.9	425	M	MG	SC	3+		unidentified insects			
lake whitefish	30.4	450	M	MT	SC	3+		unidentified insects			
lake whitefish	30.9	500	M	MG	SC	3+		mosquito larvae		shrimp	
lake whitefish	32.3	630	M	MT	SC	5		unidentified insects		shrimp	
lake whitefish	32.8	580	F	MG	SC	3+		unidentified larvae		shrimp	
lake whitefish	33.1	585	F	MG	SC	4+		beetle		worms detritus	
lake whitefish	33.3	660	F	MG	SC	4+		aquatic insects		worms shrimp	
lake whitefish	34.1	735	F	MG	SC	4+				shrimp	
lake whitefish	34.8	645	M	MT	SC	5+		unidentified larvae		worms detritus	
lake whitefish	36.8	910	F	MT	SC	6+					silver coloured cyst in body cavity
lake whitefish	37.7	860	M	MT	SC	6+					
lake whitefish	37.8	870	M	MG	SC	7+		mosquito larvae		worms detritus	
lake whitefish	38.0	900	F	MG	SC	6+		unidentified larvae		shrimp	
lake whitefish	39.0	930	F	MG	SC	7+		mosquito larvae		shrimp	
lake whitefish	39.4	1,075	F	MT	SC	7+		mosquito larvae			
lake whitefish	39.4	1,075	F	MG	SC	7+		beetles			24 eggs retained are resorbing
lake whitefish	40.0	990	F	MG	SC	7+		mosquito larvae			

AGE DETERMINATION COMPLETED BY:
Margaret MacDonald, Box 243, Midway, B.C.

AGE DETERMINATION VERIFIED BY:
Arne Langston, Peace Fisheries Compensation Program, Prince George, B.C.